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E-PROCUREMENT AND THE U.S. MILITARY

by

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Preface

From 1997 to 1998, I worked as an action officer for General Babbitt, commander of Air Force Material Command. In that short time, General Babbitt impressed upon me the need for efficiency and cost savings, in addition to effectiveness, in all aspects of military acquisition. Electronic procurement or e-procurement strikes me as a means by which to improve the efficiency and lower costs of both weapons systems and base level procurement. I researched electronic procurement in order to educate myself as well as others who might be interested in this up-and-coming procurement method.

Throughout my "education process" with e-procurement, I appreciate the willingness of the following people to take the time to answer my questions and provide me with their insight: Lieutenant Colonel Paul Yandik at SAF/AQ, Captain Jason Ortiz at HQ AFMC/PK, Drs. Mark Nissen and Tom Housel at the Naval Postgraduate School, Lieutenant Colonel Leslie Deneault at the Defense Systems Management College, and Jamie Hewitt and John Galloway. I also want to thank my advisor, Lieutenant Colonel Phil Chansler, for his guidance and willingness to review several iterations of this paper. Finally, I want to thank my wife, Sheila, and my four daughters, Elizabeth, Sarah, Rachel, and Rebecca, for their patience and understanding as I spent some time away from the family researching this topic.

Abstract

The Department of Defense (DoD) is calling for "transformation" in both how it fights and the acquisition processes that support the war fighters. Meanwhile, companies worldwide are undergoing transformation as they harness the power of Internet-enabled tools. One significant aspect of industry's transformation is electronic or e-procurement. E-procurement consists of multiple electronic facets, including catalogs, bidding, English auctions, reverse auctions, market exchanges, and paperless "end-to-end" systems. To varying degrees, these different aspects of e-procurement allow for simpler and faster ordering, reduced paperwork, easy on-line comparison, fewer human errors, and ultimately, lower costs.

The purpose of this paper is to analyze the progress of the U.S. military with e-procurement. A qualitative case study of the IBM Corporation is used as an example for comparison with the military. In addition, numerous interviews were conducted with e-procurement program managers in both the government and private industry. Assessments were also made based on recent articles in the business press.

Through process teams, the DoD should continue to thoroughly study procurement processes, particularly the "bottlenecks" in the current systems. However, a major cultural change will be required as highly bureaucratic, paper-filled processes become electronic. As such, the highest leaders within DoD will have to fully embrace e-procurement in order to make the organizational changes and financial investments that

are required to capitalize on this new way of transacting business in the twenty-first century.

Chapter 1

Introduction

> *Today, we are on the verge of another revolution. Inventions like the computer, fiber optic cable, and the Internet are changing the way we work, learn, and communicate with each other.*
>
> — President William Clinton[1]

The Internet is revolutionizing the way in which business is conducted around the world. In the mid-1990s, the Internet was simply viewed as an alternative channel for buying and selling goods and services. Now, in many cases, companies realize that much of their businesses should be focused around this open and flexible network. In just a few short years, electronic business or *e-business* has effectively redefined the standards of performance, speed, and price in an increasingly global marketplace. Although once only connected with "dot com" firms," e-business could have a greater impact on the large, established corporations of the world.

One of the ways in which business is changing around the Internet that has particular relevance to the United States military is in the area of procurement. Gebauer, Beam, and Segev define procurement as "all of the activities involved in obtaining material and services and managing their inflow into an organization toward the end user. It includes obtaining manufacturing supplies for an assembly line as well as obtaining paper and

pencils for a bank."[2] In both the private and public sector, the procurement process has traditionally consisted of endless paperwork and layers of bureaucracy.

With most organizations spending at least one third of their overall budgets on purchasing goods and services, procurement holds significant business value.[3] In order to reduce costs and improve efficiency in their supply chains, companies ranging from IBM to General Electric to Ford have turned to Internet-enabled tools and processes known as *e-procurement*.

"Transformation" in the Department of Defense

Within the Department of Defense (DoD) today, transformation is the new buzzword, and this concept includes not only weapons and war fighters, but also the processes by which goods and services are procured. In fact, on 10 September 2001, Secretary of Defense Donald Rumsfeld, in a keynote address at the DoD Acquisition and Logistics Excellence Week, stated,

> Just as we must transform America's military capability to meet changing threats, we must transform the way the Department works and what it works on. We must build a Department where each of the dedicated people here can apply their immense talents to defend America, where they have the resources, information and freedom to perform. Our challenge is to transform not just the way we deter and defend, but the way we conduct our daily business.[4]

Much of Rumsfeld's emphasis on transformation in acquisition processes is derived from the concept of the Revolution in Business Affairs (RBA), which calls for large-scale changes in the way in which procurement and other business practices are conducted in the DoD. In June 1997, then Secretary of Defense William Cohen called for a future "Revolution in Military Affairs" or RMA, which he believed must be accompanied by this RBA.[5]

Thesis of Research

In this era of transformation and reduced acquisition budgets, the Department of Defense must implement ways to improve efficiency and cut costs in its multi-billion dollar procurement processes. Since the mid-1990s, large corporations, such as IBM, have viewed technological methods, particularly procurement via the Internet, as key agents for slashing costs and improving efficiency. The Department of Defense must do the same. Until now, the DoD has studied e-procurement processes and avoided any "one size fits all" solutions. This is good. However, it must prepare to change its paper-driven culture and exploit "up and coming" facets of e-procurement, such as auctions, reverse auctions, and market exchanges, which promise "order of magnitude" savings. The key to all of this is stronger advocacy of e-procurement at the highest levels of the Department of Defense.

Methodology

In order to examine e-procurement and its application to military acquisition processes, a number of primary and secondary sources were qualitatively assessed. Interviews were conducted with e-procurement program managers in the military services, executives leading e-business efforts at the IBM Corporation, and academics teaching information technology at the Naval Postgraduate School and acquisition at the Defense Systems Management College. In addition, a number of web sites and articles from the business press were reviewed. Finally, internal briefings and "white papers" from defense agencies, the military services, and IBM were examined.

Notes

[1] President William Clinton, memorandum for the heads of executive departments and agencies, subject: Electronic Commerce, 1 July 1997.

[2] Judith Gebauer, Carrie Bean, and Arie Segev, "Impact of the Internet on Procurement," *Acquisition Review,* Spring 1998, 169.

[3] Ibid.

[4] Secretary of Defense Donald Rumsfeld, "Kickoff Remarks at the DoD Acquisition and Logistics Excellence Week," 10 September 2001.

[5] Eleanor Spector, "Improving/Standardizing DoD Procurement Business Processes," *Program Manager*, November-December 1997, 10.

Chapter 2

What is E-Procurement?

E-procurement is one of many new terms that have emerged in the business vocabulary since the mid-1990s. Other common terms today surrounding business applications of the Internet and World Wide Web include e-business and e-commerce. E-business represents a combination of technologies, business models, and managerial techniques that can enable fundamental process innovation within a firm. Meanwhile, e-commerce is a subset of e-business and is focused on the revenue-generating aspects of the firm.[1] Generally, e-procurement is considered a subset of the larger effort by a firm to become an e-business and is particularly focused on the way companies manage their supply chains.

Types of E-Procurement

Currently, e-procurement consists of multiple electronic aspects including *catalogs, bidding, English auctions, reverse auctions, market exchanges*, and *end-to-end procurement* processes. Explanations of each are provided below.

Electronic or e-catalogs are simply custom catalogs that suppliers establish on the Internet.[2] An example of an electronic catalog would be a web interface used by companies to order office supplies from a common negotiated price list. Prices for each company are likely to be lower because they are based on the annual volume purchased

by the entire company. In addition, payments for companies ordering from e-catalogs can be consolidated automatically, expense statistics can be monitored and budgeted easily, and paperwork, on the whole, is minimized.[3] In 1995, the General Services Administration (GSA) established *GSAAdvantage!,* which is an e-catalog for federal government organizations to procure goods. With *GSAAdvantage!*, federal employees can go on line and order over a million GSA stock items from the federal supply system.[4]

Figure 1 - GSAAdvantage! Web Site (www.gsaadvantage.gov)

Electronic bidding consists of a request for quote (RFQ) that is sent electronically by a company to different suppliers and then is received and evaluated electronically.[5] An example of bidding would be an aircraft corporation sending electronic RFQs to multiple tire suppliers in order to find the best quality and price for a type of tire. With electronic bidding, paper contracts and associated documents for transactions are eliminated and the entire procurement is completed much quicker than if it were done through the mail or person-to-person. In 2001, GSA added electronic bidding, which is called *e-Buy*, to *GSAAdvantage!*. With *e-Buy*, federal buyers can post requests for proposals for specific services and contractors are notified of those opportunities in e-mails. Contractors can then offer quotes over the *e-Buy* web site that is embedded within *GSAAdvantage!*[6]

An *electronic English auction* is an Internet version of the well-known type of auction that is initiated by one seller and the price rises during the auction. The final price is dependent on the bids of other buyers, and the last bid is known to all of the buyers.[7] By accessing a web site, buyers can check the current spot prices of a variety of

items in order to determine whether to purchase or wait for the prices to become more favorable.

In an electronic *reverse auction*, a buyer initiates the auction by specifying his demand and specifications in a RFQ. During the on-line, real-time auction, suppliers are able to submit price quotes and view the quotes of competitors. With a time limit placed on the auction, suppliers then submit price quotes and are able to view the other quotes that are submitted. As opposed to English auctions, the price drops during the auction, with the last bid being known to all of the bidders. In some cases, multiple buyers may aggregate their purchasing power to get deeper discounts on the total quantity than any one purchaser. Reverse auctions are most useful for commodity-type procurements in which there are clear and well-defined specifications from the buyer. Entire companies, such as *FreeMarkets* and *TradeOut*, are dedicated to creating electronic reverse auction sites, as well as other e-procurement tools, for firms without the internal capabilities to do it themselves.

A *market exchange* is an electronic marketplace where multiple buyers and sellers can get together and exchange goods at spot prices. Also called *business-to-business (B2B)* or *electronic hubs*, market exchanges have become popular among the largest Fortune 500 firms in the last couple of years. For example, in March 2000, Boeing, Lockheed Martin, BAE Systems, and Raytheon established a B2B exchange called *Exostar* with hopes of cutting transaction expenses, aggregating buying power, and exploiting the efficiencies of a single marketplace.[8] Together the four companies do $71 billion of business each year with 37,000 suppliers and hope to save billions of dollars through the exchange.[9] In April 2000, Ford, General Motors, and Daimler Chrysler

followed suit by creating their own online auto-supplier network called *Covisint* that processes more than $240 billion in annual spending.[10]

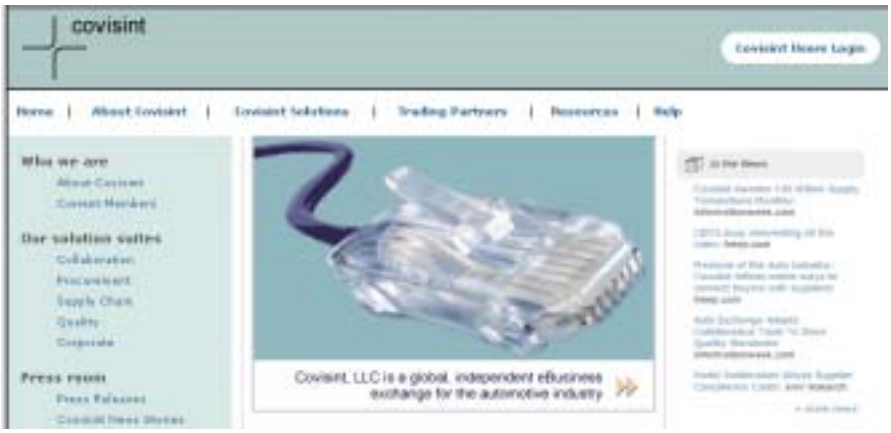

Figure 2 – Covisint Automobile Market Exchange Web Site (www.covisint.com)

Finally, *end-to-end procurement (ETE) systems* are contracting systems that integrate and share data from numerous independent contracting and financial systems. Unlike the five aspects of e-procurement discussed above, ETE is a *system* internal to an organization that provides a seamless exchange of data from systems that had limited ability to "communicate" in the past. Many ETE systems have the capability to interact with e-catalogs and perform auctions.

ETE systems are particularly attractive to the DoD because they electronically store that which is usually saved on paper, such as purchase orders, supplier acknowledgements, shipping and receiving documents, invoices, accounts payable vouchers, supplier payments, and account reconciliation reports. In addition, ETE provides a "single point of entry" for contracting, finance and other procurement officials. These personnel no longer have to "re-key" data, which can lead to numerous

errors, because information is passed from system to system. Instead, the ETE system links all of these systems and databases and shares all of the information and data.[11]

The Advantages of E-Procurement

According to Booz-Allen & Hamilton, a large U.S. consulting firm, the advantages of e-procurement fall in three areas: "streamlined processes, reduced costs, and the opening of new business opportunities."[12] First, e-procurement streamlines processes because of simpler and faster ordering, reduced paperwork, easy on-line comparison, fewer human errors, and lower inventory costs. Second, cost reductions are possible because comparisons can be easily made and buys can be aggregated across an enterprise. In the private sector, annual cost savings from e-procurement generally range from 25 to 50 percent.[13] Finally, new business opportunities, which are of more concern to the private sector than the public, arise because of access to new customers from the information that is generated from the transactions.[14]

The simple example of a company procuring office supplies from an electronic catalog highlights some of the advantages of e-procurement. If a company is composed of different departments or plants, possibly in different locations across the country or around the world, each may buy office supplies from different suppliers, unaware of the others' actions. As a result, prices may vary based on the individual negotiating abilities of personnel and the differing volume that is purchased in each department. In addition, the order processing is usually done manually with phone calls and faxes, management approval may be required for each transaction, and separate payments may need to be generated for each requisition.

With an e-catalog, the purchases can be aggregated across the company and discounted prices are available based on the volume of the purchases. In addition, a company can make a single payment for the goods and easily track all of its transactions. Air Force Materiel Command (AFMC) is hoping to reap these types of benefits as it implements its *E-Purchase* web site in the spring of 2002. With *E-purchase*, AFMC employees can order a variety of supplies for their organization with the Government Purchase Card.[15]

Another significant benefit of e-procurement is the "pushing" of the purchasing of goods and services down to the end users. As a result, the size of the procurement function within companies will likely decrease over time because individual employees can acquire the goods and services that they need for their tasks. Since 50% of the DoD civilian acquisition work force is eligible to retire by 2005, smaller procurement organizations should be particularly attractive to the military.[16] In the future, if military contracting and finance tasks are web-driven, the DoD will be able to hire fewer, yet more technologically capable employees to replace these retiring procurement specialists.

Interestingly, the advantages of e-procurement mentioned above have had a powerful effect not only on small "dot com" firms, but on large, established companies in the United States.[17] Of these large companies, none has been more successful with e-business applications across the spectrum than IBM, which will be highlighted in the next chapter.

Notes

[1]Dr. Tom Housel, Professor of Information Technology and Acquisition Management, Naval Postgraduate School, interviewed by author, 26 February 2002.

[2] Booz-Allen & Hamilton, *E-sourcing: 21st Century Purchasing* (2000), 3.

[3] Ibid.

[4] GSAAdvantage!, on-line, Internet, 25 January 2002, available from http://www.gsaadvantage.gov.

[5] Ibid.

[6] Dan Davidson, "GSA's Newest Buying Tool Slow to Catch On," *Federal Times*, 3 December 2001, 2.

[7] Ibid.

[8] "The Impact of B2B," *Computerworld*, 2 October 2000, n.p., on-line, Internet, 26 November 2001, available from http://www.computerworld.com.

[9] "In the Air," *Economist*, 1 April 2000, 62.

[10] J. William Gurley, "BigCompany.Com: Should You Start a B2B Exchange?," *Fortune*, 3 April 2000, 260.

[11] Gary Thurston and Will Bishop, "End-to-End Procurement Process in DoD," lecture, Defense Systems Management College, Fort Belvoir, VA, 8 February 2002.

[12] Ibid.

[13] "Instituting E-Procurement in the Public Sector," *Public Management*, November 2000, 21.

[14] Ibid.

[15] Capt Jason Ortiz , Command eProcurement Functional Manager, HQ AFMC/PK, interviewed by author, 7 January 2001.

[16] James H. Gill, "Crisis in the Acquisition Workforce: Some Simple Solutions," *Acquisition Review Quarterly*, Spring-Summer 2001, 85.

[17] "E-Management: Older, Wiser, Webbier," *The Economist*, 30 June 2001, 10.

Chapter 3

E-Business at IBM

> *Our chairman of the board chose e-business to be the most important corporate strategy. It's the focal point of every division of the IBM company: the software, services, and server groups, and the PC business.*
>
> — Alfred Spector, General Manager of Marketing and Strategy, IBM[1]

Many of America's largest Fortune 500 companies, such as Boeing, General Electric, Ford, and Daimler Chrysler, adopted e-procurement strategies in the last few years. Arguably, none has been as successful as International Business Machines (IBM). Interestingly, prior to embarking on its e-business journey, IBM was remarkably similar to any of the United States military departments today, in terms of numbers of employees and organizational structure.

In 1993, IBM began transforming itself into one of the world's first and now most successful e-businesses. Absolute necessity drove IBM to this complete shift in business strategy. Over an eight-year period beginning in 1985, IBM's market value plunged from $95.7 to $32.8 billion. From 1991 through 1993, IBM lost $16 billion, including $8.8 billion in 1993, which was the largest loss of any corporation in any year in history. [2]

In the early 1990s, IBM was a highly complex corporation with many redundant operations. The firm had 400,000 employees doing business in 160 countries. Within

IBM, there were 20 different businesses, each with its own manufacturing, accounting, information technology, and payroll systems.[3] Jamie Hewitt, Vice President of E-Business Transformation within IBM's Server Group, mentioned in an interview that the complexity was not only difficult for IBM to manage, but customers did not know how to interface with the company because there was not a single, integrated IBM with which to deal.[4]

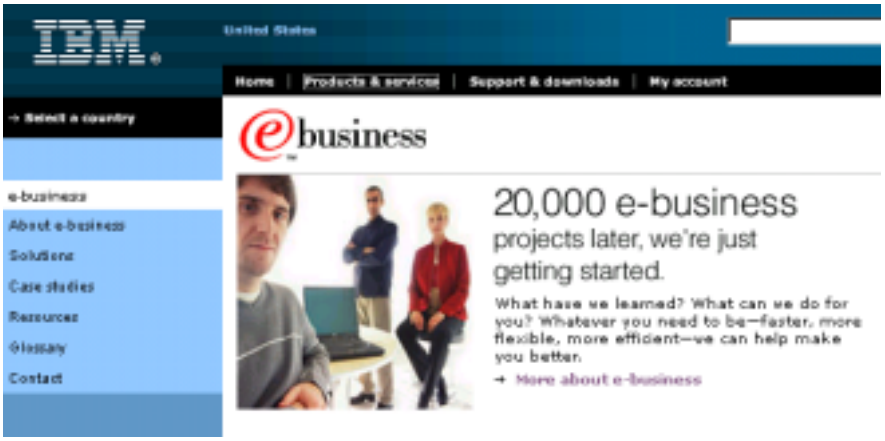

Figure 3 – IBM E-Business Web Site (www.ibm.com)

In order to alleviate the immediate financial crisis, IBM eliminated more than 117,000 jobs, incurred more than $28 billion in restructuring charges, and consolidated almost 300 different financial systems into fewer than 30. However, more significantly, IBM Chairman Louis Gerstner recognized that the most important application for the Internet would be business transactions, not simply having the best browser or search engine.[5] As a result, Gerstner chose e-business, which is broader in focus than e-procurement, to be the most important corporate strategy. It became the focal point of every division of the IBM company: software, services, server groups, and the PC business.

IBM reengineered its core business processes about what it now calls the "e-business cycle." The e-business cycle consists of "leveraging knowledge and information, transforming business processes, building new applications, and running a scalable, available, secure environment."[6] Largely due to the e-business transformation, IBM generated more e-business revenue and profit in 1999 than all of the top Internet companies, such as Yahoo!, America Online, Amazon.com, eBay, and E*Trade, combined.[7]

IBM and E-Procurement

From an e-procurement standpoint, IBM today buys 98 percent of the goods it needs through the Internet. Everything from office supplies to computer components are ordered online from 31,000 suppliers around the world. In order to do this, IBM uses e-catalogs as well as a variety of electronic auctions. Through the third quarter of 2001, IBM purchased $30 billion in goods online and saved $284 million in the process.[8]

Today, IBM's e-procurement processes consist of tens of thousands of suppliers, hundreds of millions of products, and tens of thousands of catalogs for more than 300,000 IBM buyers.[9] Their offerings in e-procurement include catalogs, contract procurement, auctions, strategy and consulting services, hosting, systems integration, and security.[10] In addition, IBM uses a fully integrated ETE procurement system internally and is currently proposing such systems to government organizations.

One of the main advantages that IBM discovered with the implementation of e-procurement was increased control over purchasing. In the late 1980s and early 1990s, IBM noticed a significant increase in what is termed "maverick buying." Maverick buying is when employees "go around" the procurement process in order to avoid the

bureaucracy. However, many times, the firm ends up paying higher prices as a result of maverick buying. When IBM began the e-procurement reengineering initiative, 60 percent of the employees said they were dissatisfied with the current processes. Within IBM, it typically took 30 days to process a purchase order, contracts averaged more than 40 pages, and the entire contract cycle took six months to a year.[11] Maverick buying plummeted after the implementation of e-procurement.

While improved control over purchasing was a significant advance in IBM, a more significant change involved the role that information technology played in the company. No longer were the chief information officer and the information technology function seen as "back office personnel and functions," such as payroll and billing. Instead, IBM views technology as an agent for cutting costs.[12]

IBM's success with e-business has not gone unnoticed by the Department of Defense. Executives from IBM frequently discuss their lessons learned with senior military leaders from all of the services in forums such as the Center for Executive Education at the Naval Postgraduate School. Within the Air Force, IBM officials have briefed the senior leaders at Headquarters Air Force Materiel Command.[13] DoD leaders are certainly interested in strategic change in their business processes of the magnitude of IBM's. Nevertheless, the military's efforts with e-business, particularly e-procurement, have been very small relative to IBM's. The next chapter will examine the progress of the Department of Defense with e-procurement specifically.

Notes

[1] Elizabeth U. Harding, John P. Desmond, and Colleen Frye, "IBM: Making Money on E-Business," *Software Magazine*, December 1999, 10.

Notes

[2] Jamie Hewitt, IBM Vice President of Transformation, Server Group, "White Paper on IBM's Business Transformation," 1998.

[3] Ibid.

[4] Jamie Hewitt, IBM Vice President of Transformation, Server Group, interviewed by author, 10 December 2001.

[5] Ira Sager, " Inside IBM: Internet Business Machines," *Business Week*, 13 December 1999, n.p., on-line, Internet, 1 December 2001, available from http://www.businessweek.com.

[6] Jamie Hewitt, IBM Vice President of Transformation, Server Group, interviewed by author, 10 December 2001.

[7] Ira Sager, " Inside IBM: Internet Business Machines," *Business Week*, 13 December 1999, n.p., on-line, Internet, 1 December 2001, available from http://www.businessweek.com.

[8] Julie Moran Alterio, "Cooking Up Savings," *The Journal News*, 6 December 2001, n.p., on-line, Internet, 20 December 2001, available from http:/www.thejournalnews.com.

[9] "e-Procurement in Government," IBM web site, on-line, Internet, 28 January 2002, available from http://houns54.clearlake.ibm.com.

[10] Ibid.

[11] Jamie Hewitt, IBM Vice President of Transformation, Server Group, interviewed by author, 10 December 2001.

[12] Julie Moran Alterio, "Cooking Up Savings," *The Journal News*, 6 December 2001, n.p., on-line, Internet, 20 December 2001, available from http:/www.thejournalnews.com.

[13] Lt General Leslie F. Kenne, "Revolution in Business Practices, " Briefing to AFMC/CC, September 2001.

Chapter 4

E-Procurement and the Department of Defense

Since the mid-1990s, nearly all federal departments and agencies have embraced some e-business practices. Because of the scope and dollar values of its procurement processes, the Department of Defense has been the most interested in electronic procurement. This chapter will highlight the U.S. military efforts with e-procurement, which span numerous organizations and levels within the DoD and the military departments.

The DoD's Central Electronic Business Program Office

In order to facilitate the overall transition to electronic business, the Secretary of Defense established the Joint Electronic Commerce Program Office (JECPO) in May 1998.[1] The charter of JECPO was to "support, facilitate, and accelerate the application of electronic business practices and associated information technologies to improve DoD processes and support weapons and combat support systems throughout their life cycles."[2]

One of JECPO's first tasks was to construct the *DoD E-Mall*, which provides search capability across all Internet-based DoD electronic catalogs, as well as a number of

commercial catalogs. In fiscal year (FY) 2000, E-Mall contained nearly 5 million items and processed $78.8 million of transactions.[3]

Figure 4 – DoD E-Mall Web Site (www.emall.dla.mil)

In 2001, JECPO was renamed the Defense Electronic Business Program Office (DEBPO). Headed by a senior DoD civilian with an Air Force colonel as the deputy, DEBPO developed the DoD Strategic eBusiness Vision: "By 2010, an enterprise-wide

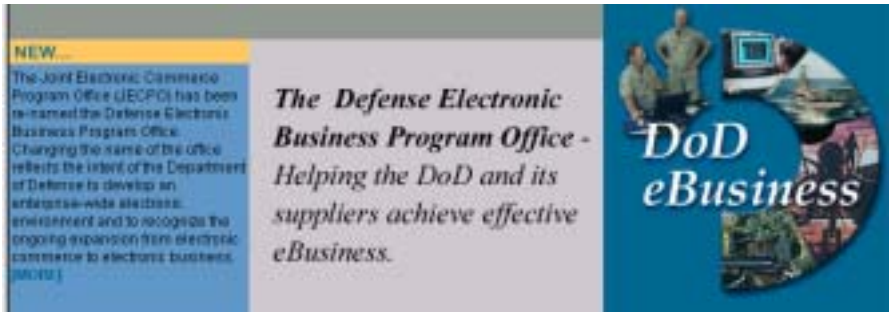

Figure 5 –DEBPO Web Site (www.defenselink.mil/acq/ebusiness)

electronic environment will exist where best business practices and enabling technologies are used to facilitate the most efficient exchange of the full range of business information resulting in streamlined and rapid response to the war fighter and supporting the Defense missions."[4] With the exception of the establishment of the *DoD E-Mall*, DEBPO has primarily functioned as an "information exchange" for the best e-business practices across the Defense Department. DEBPO provides DoD education and training organizations with electronic business resources for the classroom.

End-to-End Procurement in the DoD

For the most part, the Defense Department has pursued e-procurement by focusing on end-to-end (ETE) procurement systems for all acquisitions above $2,500.[5] As mentioned in the Chapter 2, ETE consists of a seamless system that integrates all of the phases of acquiring a good or service, including contract writing, purchase request generation, vendor sourcing, payment, contract award, and contract closeout. Currently, 23 different aging systems provide these functions, which can lead to numerous accounting errors because of the manual data entry required throughout the process.[6]

In December 1998, Defense Reform Initiative Directive #47 (DRID #47) established an integrated process team (IPT) chaired by the Defense Contract Management Agency and the Defense Finance and Accounting Service to develop a model of ETE for the DoD.[7] Currently, the ETE Procurement Process IPT is composed of over 150 DoD and industry participants.[8] With the overall goal of linking these current systems and eliminating those that are duplicative, the ETE Procurement Process IPT thus far has developed "system maps," which step through the ETE process and identify all of the interfaces. Future plans include building a DoD-wide ETE implementation plan, developing metrics, writing new business rules, and seeking to change language within the Federal Acquisition Regulation.[9] Appendix A describes the systems within ETE that the IPT is hoping to implement. While the ETE Procurement Process IPT has made significant progress, ETE is still four to five years away from being fully implemented in the DoD.[10]

The Military Departments and E-Procurement

Among the military departments, the U.S. Navy, along with the Marine Corps, appears to be the most aggressive in examining and implementing e-procurement processes. Meanwhile, the Air Force is somewhat behind the Navy, while the Army appears to have done the least of the three in the e-procurement arena. Recently, the Army Forces Command used reverse auctions to purchase computers and saved nearly 11 percent as a result.[11] However, because the Army is mostly following the leads of the other departments in e-procurement, only the Navy and the Air Force will be addressed in this section.

The U.S. Navy and E-Procurement

Of the military departments, the Navy is the furthest ahead in implementing web-based tools into its procurement processes. One of the keys to the Navy's success has been the recognition of the need for an overall strategy for e-procurement within the service. Advocated by officials as high as the Under Secretary of the Navy, this strategy allows the Navy to integrate functional "stovepipes," such as contracting, finance, and logistics, that often hinder any widespread and lasting changes to procurement processes.

In September 2000, the Navy established the Department of the Navy E-Business Operations Office with overall responsibility for implementing and integrating Navy e-business efforts. Led by a flag officer with a small cadre of military and civil service personnel, the E-Business Operations Office is part of the Naval Supply Systems Command (NAVSUP) at Mechanicsburg, Pennsylvania.[12] NAVSUP is the logistics arm of the Navy responsible for supply operations, conventional ordinance, contracting, resale, fuel, and transportation.[13] An innovative feature of the E-Business Office has

been a $20 million program in which the Navy solicits pilot technology projects from the public and private sectors that can be applied to e-business operations in the Navy. The pilot submission and selection process is conducted via the Internet, and the goal for the initiatives is to demonstrate a proof of concept within 90 days or less.[14]

Figure 6 – Navy's Electronic Business Web Site (www.don-ebusiness.navsup.navy.mil)

At the strategic level, the Navy's E-Business Operations Office has developed a comprehensive E-Business Plan for the entire Navy, consisting of four goals:

- Goal 1: Maximize the value of Navy investments in systems and infrastructure by incorporating e-business commercial best practices and technologies into the Navy's plans, processes, information management/information technology architecture and systems.

- Goal 2: Reengineer war fighting support and other core business processes in preparation for e-business technology infusion, to maximize Navy mission effectiveness and efficiency.

- Goal 3: Foster the cultural change necessary so that business process reengineering and e-business are embraced and become pervasive.

- Goal 4: Facilitate the creation and sharing of e-business knowledge to enable e-business implementation.[15]

At an "operational" level, the Navy has fully embraced ETE and is an active participant on the DoD ETE Procurement Process IPT. In addition, the Navy is the first of the military departments to fully develop an e-procurement web site, which is called *One Touch Support*. *One Touch Support* is a single point of entry system that allows

Navy and Marine Corps personnel to search for supplies and repair parts, check the status of requisitions, and make purchases with the Government Purchase Card.[16] In the past, personnel would have to search many different databases, each requiring its own ID and password, and often using separate terminals, to access information now available through the single web site, *One Touch*.[17]

Figure 7 – Navy One Touch Support Web Site (www.onetouch.navy.mil)

In addition to establishing a single point of entry into its supply and requirements systems and establishing the framework for a paperless procurement system, the Navy has been successful with reverse auctions. In May 2000, the Navy held a reverse auction for recovery sequencers, which are used in ejection seats. As a result, the Navy saved about $1 million and was able to award the contract within *45 minutes* of the conclusion of the electronic auction.[18] In June 2000, the Navy held a reverse auction for "ship-related" services and saved the service almost $3 million.[19] More recently, the Navy established a reverse auction to source a contractor to transport the household goods of personnel between Hawaii and Guam. The Navy planned to spend $3 million over five years for the contract, but as a result of the auction, only ended up spending $2.1 million, a savings of about 30 percent.[20]

All in all, the Navy's relative success with e-procurement appears to be largely due to the fact that it possesses an overall strategy for the implementation of e-business. This strategy starts at the highest levels of Navy leadership and extends to many of its organizations through the efforts of its E-Business Operations Office.

The U.S. Air Force and E-Procurement

Unlike the Navy, the Air Force does not have a program office for managing its e-procurement efforts. As a result, it does not have a unifying strategy for Internet-based acquisition and its e-procurement initiatives are more fragmented and fewer in number than the Navy.

A likely organization to lead overall e-procurement within the Air Force would be the department's contracting office within the Air Staff, SAF/AQC. However, SAF/AQC is currently only responsible for ETE within the Air Force, and within SAF/AQC, a single lieutenant colonel action officer is the ETE program manager. This lack of high-level oversight creates redundancies within Air Force for ETE. For example, Langley AFB in Virginia has attempted to develop a "small scale" end-to-end system. However, it is largely duplicative of the ETE Procurement Process IPT's efforts and will likely be terminated soon as a result.

With the Air Staff managing ETE, the Contracting Directorate at Air Force Materiel Command, HQ AFMC/PK, is close to implementing an electronic catalog, called *E-Purchase*, where Government Purchase Card users can order supplies.[21] Instead of procuring supplies for less than $2,500 from different vendors, *E-Purchase* will aggregate purchases electronically across the command to take advantage of volume discounts.[22] The Warner Robins Air Logistics Center at Robins AFB in Georgia already

uses a similar, yet smaller catalog for aircraft parts.[23] With these types of e-catalogs, Air Force organizations will be able to track how Government Purchase Card funds are being spent.[24] Until now, this "business intelligence data," which is easily available to most commercial firms, has been sorely lacking in the military. Obtaining this type of information is truly a significant step for the Air Force and the Department of Defense.

Finally, the Air Force has used reverse auctions to a limited extent. In August 2000, the Air Force successfully used a series of reverse auctions to buy computers for Air Combat Command at Langley AFB. Through these auctions, the Air Force saved about 27 percent off the $325,000 estimated cost for the equipment. One particular auction generated more than a 35% savings from the best available price on an existing government contract.[25]

As one can see, the Air Force, Navy, and the Department of Defense are interested in the cost savings and efficiency improvements promised by e-procurement. However, there is still much work to be done. The next chapter provides some key recommendations for the military to consider as it continues with its e-procurement initiatives.

Notes

[1] ADR 2000, "Defense Reform Initiative," on-line, Internet, 4 December 2001, available from http://www.dtic.mil/execsec/adr2000/chap12.html.

[2] John J. Hamre, memorandum to chairman of the joint chiefs of staff, under secretaries of defense, defense directors, and defense agency directors, subject: Department of Defense Reform Initiative Directive #43: Defense-wide Electronic Commerce, 20 May 1998.

[3] J. Michael Brower, "The Promise of e-Commerce to Defense: The Road to Savings," *Military Review*, July-August 2001, 97-98.

Notes

[4] Defense Electronic Business Office, on-line, Internet, 4 December 2001, available from http://www.defenselink.mil/acq/ebusiness.

[5] Lt Col Paul Yandik, Program Manager, Air Force End-to-End Procurement Systems, SAF/AQCK, "End-to-End Procurement Model," briefing, 15 June 2001.

[6] Lt Col Paul Yandik, Program Manager, Air Force End-to-End Procurement Systems, SAF/AQCK, interviewed by author, 18 December 2001.

[7] Lt Col Paul Yandik, Air Force End-to-End Procurement Systems, SAF/AQCK, "End-to-End Procurement Model," briefing, 15 June 2001.

[8] Ibid.

[9] Gary Thurston and Will Bishop, "End-to-End Procurement Process in DoD," lecture, Defense Systems Management College, Fort Belvoir, VA, 8 February 2001.

[10] Lt Col Paul Yandik, Program Manager, Air Force End-to-End Procurement Systems, SAF/AQCK, interviewed by author, 18 December 2001.

[11] Carol Byrd, "The Allure of Reverse Auctions," *Contract Management*, November 2001, 30.

[12] "Charter for the Department of the Navy eBusiness Operations Office," 21 September 2000, n.p., on-line, Internet, 9 Jan 2002.

[13] "e-Procurement in Government," IBM web site, on-line, Internet, 28 January 2002, available from http://houns54.clearlake.ibm.com.

[14] Ibid.

[15] DoN eB Strategic Plan 2001-2002, n.p., on-line, Internet, 7 January 2001, available from http://www.don-ebusiness.navsup.navy.mil.

[16] "Navy Awards Contract to Build Next Generation of One Touch Support," IBM web site, on-line, Internet, 28 January 2002, available from http://houns54.clearlake.ibm.com.

[17] DoN eB Strategic Plan 2001-2002, n.p., on-line, Internet, 7 January 2001, available from http://www.don-ebusiness.navsup.navy.mil.

[18] Carol Byrd, "The Allure of Reverse Auctions," *Contract Management*, November 2001, 31.

[19] Colleen O'Hara, "Feds Buy Into Reverse Auctions," *Federal Computer Week*, 14 August 2000, n.p., on-line, Internet, 9 January 2002.

[20] Lisa Terry, "Governments Poised for Widespread E-Procurement Usage," *Washington Technology*, 13 August 2001.

[21] Capt Jason Ortiz, Command eProcurement Functional Manager, HQ AFMC/PK, interviewed by author, 7 January 2001.

[22] Lt Col Patrick McMichael, Technical Director, AF Contracting System Program Office, interviewed by author, 26 February 2002.

[23] Capt Jason Ortiz, Command eProcurement Functional Manager, HQ AFMC/PK, interviewed by author, 7 January 2001.

[24] Ibid.

[25] "Air Force Reaps Savings," *Federal Computer Week*, n.p., on-line, Internet, 9 January 2002, available from http://www.fcw.com.

Chapter 5

Recommendations for the Future

On December 7, 2000, when introducing the Navy's new e-Business Operations Office, Deputy Under Secretary of the Navy, Charles Nemfakos stated, "For those of you who have been covering the Pentagon for a long time, you know how we normally do things, right? We create organizations, we create bureaucratic means, we establish processes. Several years later, we actually start doing something."[1] The Department of Defense cannot let this be its approach to electronic procurement. In a briefing to the Air Command and Staff College, Norm Augustine, the highly respected CEO of Lockheed-Martin stated that the speed in which business leaders make strategic decisions is of utmost importance. He explained that in an informal survey he did of top CEOs who recently made important strategic decisions for their companies, 90% of the CEOs wished they had in fact moved more quickly.[2]

The current Revolution in Business Affairs and the associated transformation discussed by the Secretary of Defense call not only for far-reaching change but also for rapidity in the change process. In order to harness the benefits of e-procurement, the DoD must be prepared to act quickly and wisely. The following are some recommendations for the DoD and the military departments to consider as they continue to study and implement electronic procurement:

The DoD End-to-End IPT must examine "bottlenecks" in current procurement processes

In the past, the DoD or one of the military departments would latch onto a best practice from the commercial world and attempt to overlay it on its own severely broken processes. Some would argue that this was the Air Force experience with Total Quality Management in the early 1990s. The ETE Procurement Process IPT is doing valuable work by examining the entire procurement process with "system maps" and identifying interfaces. However, the IPT must pay careful attention to "bottlenecks" in the system and realize that technology alone will not solve these problems.

In an interview, Dr. Tom Housel, Professor of Information Technology and Acquisition Management at the Naval Postgraduate School, cautioned that there will be few benefits to ETE if "bottlenecks" are not identified and solved.[3] As an example, in the case of the ETE, an electronic contract may be completed only to have it reside on a clerk's computer somewhere awaiting some final step of approval.

According to Jamie Hewitt, Vice President for E-Business Transformation at IBM, one of CEO Lou Gerstner's foremost initiatives in the mid-1990s was to breakdown and to fully understand organizational processes.[4] IBM identified 11 core processes on both the hardware and software sides of the company and then sought to understand the value that each of these processes added to the company.[5] The ETE Procurement Process IPT is doing a similar effort. However, extensive discussions with successful e-business corporations, like IBM and GE, may help the IPT to discover and alleviate bottlenecks in current military procurement systems.

E-procurement should continue to be adopted by the DoD on a command-by-command or organization-by-organization basis

One of the tendencies of the DoD is to embrace a new program and then mandate it across all of the services. While this may work for a program such as the Government Purchase Card, this should not be done with e-procurement. Systems must continue to be tailored to fit commands or organizations within the DoD. In an interview, Dr. Mark Nissen, Assistant Professor of Information Systems and Acquisition Management at the Naval Postgraduate School, warned against attempting to create a "one size fits all" plan for e-procurement across the DoD. He explained that large commercial firms have attempted "enterprise wide solutions" with other information technology initiatives in the recent past and their efforts have failed.[6]

With its E-Business Operations Office, the Navy is the most advanced of the services in terms developing an organizational structure to support e-procurement. The E-Business Operations Office provides vision and goals, as well as some limited oversight of e-procurement across the Navy. Meanwhile, each of the commands is left to decide upon an approach to e-procurement that best suits its needs. Both the Air Force and the Army lack this overall strategy vision and could learn much by emulating the Navy in this area.

The DoD must exploit the advantages of on-line auctions, reverse auctions, market exchanges, and other e-procurement practices

While an end-to-end procurement system may be a long-term effort, the DoD and the services must search for opportunities to use on-line auctions, reverse auctions, and possibly, market exchanges immediately. Industry has saved large amounts of money

from these various forms e-procurement. For example, while it only started implementing e-business practices in 1999, General Electric conducted a massive push with on-line auctions in 2000. In 2001, GE established $14 billion in auctions company wide and anticipated $600 million in savings as a result.[7]

In the past, the Federal Acquisition Regulation prohibited auctions, but with dramatic new contracting initiatives, government procurement officials are given much more latitude to exercise sound business judgment in their contracting decisions.[8] With all of the common goods and services that are procured across the military, an effort must be made to establish more on-line auctions and reverse auctions. In addition, opportunities may exist for the services to combine their purchasing powers and implement market exchanges, similar to those established by large portions of the automobile and aircraft industries.

DoD must be prepared to change the acquisition culture as it adopts e-procurement

Without a doubt, e-procurement changes the roles and skills required of procurement organizations and alters relationships with vendors and suppliers. At General Electric, the greatest hurdle to becoming paperless with e-procurement processes has not been technology but culture. Initially, managers had to carefully watch employees using telephones or fax machines to order supplies. Some offices within GE closed their mailrooms for all but one day a week to stop employees from using regular mail, while others locked the copier rooms except for occasional days when bosses would stand outside the door and demand explanations from those who were unable to shake their old paper habits.[9]

Clearly, the paper-consuming habits of DoD procurement personnel will have to change in order to reap the benefits of e-procurement. However, as Lieutenant General Leslie Kenne, commander of the Air Force's Electronic Systems Center at Hanscom AFB, points out, "organizations, particularly military ones, are notoriously rigid and resistant to change."[10] In the technology-driven procurement environment of the future, acquisition professionals must become more flexible and adaptable.

The Acquisition 2005 Task Force Report, "Shaping the Civilian Acquisition Workforce of the Future," warns that 50% of this skilled workforce will be eligible to retire by 2005."[11] While it certainly can be viewed as a threat to our ability to field weapons systems for the war fighters, this change can also be seen as an opportunity to educate the next generation of acquisition professionals in e-procurement. If the results are similar to industry, the DoD will need fewer procurement specialists than in the past and those that do remain will be less administrative and more strategic in function.

E-procurement must become a strategic focus of the U.S military, particularly within the Air Force and the Army

The success of the IBM Corporation in the late 1990s can be directly linked to the strategic vision of CEO Lou Gerstner. He identified the need to focus IBM on all forms of electronic business. Similar to IBM, the Department of Defense must be prepared to make widespread changes in its procurement practices. In order to do this, electronic procurement must have the full attention of senior level leaders in the Department of Defense. E-procurement cannot be handled as another program that must go through all of the "bureaucratic wickets" in the Pentagon. The implementation of e-procurement

demands swift decisions by leaders who are willing to remove organizational impediments.

The Defense Electronic Business Program Office, ETE Procurement Process IPT, and Navy's E-Business Operations Office are all good starting points, but these and other efforts must have the full support of all of the senior military leaders of each services to continue. Within the Air Force, a single lieutenant colonel is not enough manpower to advocate and manage end-to-end procurement across the service.

Overall, acquisition has usually been relegated to the "end of the line" in terms of executive attention, funding, innovation, training, and advancement. In order to effectively implement e-procurement this mindset must change. E-procurement and the associated technology must be viewed as a key method to improve efficiency and cut costs.

Notes

[1] Charles Nemfakos. "Special Briefing on the Navy's New e-Business Office," *Defense Link*, 7 December, 2000. On-line. Internet, 4 December 2001. Available from http://www.defenselink.mil/news/Dec2000.

[2] Norman R. Augustine, "Leadership," lecture, Air Command and Staff College, Maxwell AFB, AL, 29 January 2002.

[3] Dr. Tom Housel, Professor of Information Technology and Acquisition Management, Naval Postgraduate School, interviewed by author, 26 February 2002.

[4] Jamie Hewitt, IBM Vice President of Transformation, Server Group, interviewed by author, 10 December 2001.

[5] Ibid.

[6] Dr. Mark Nissen, Assistant Professor of Information Technology and Acquisition Management, Naval Postgraduate School, interviewed by author, 26 February 2002.

[7] Lisa Vaas, "GE Keeps E-Business Turned On," *eweek.com*, 12 November 2001, on-line, Internet, available from www.eweek.com.

[8] Carol Byrd, "The Allure of Reverse Auctions," *Contract Management*, November 2001, 30.

[9] "E-Strategy Brief on GE: While Welch Waited," *The Economist*, July 2001, 24.

Notes

[10] Kenne, Leslie F. Lt General, "Revolution in Business Practices, " Briefing to AFMC/CC, September 2001.

[11] Gill, James H. "Crisis in the Acquisition Workforce: Some Simple Solutions," *Acquisition Review Quarterly*, Spring-Summer 2001, 85.

Chapter 6

Conclusion

The costs and efficiency of the acquisition process within the United States military, whether for weapon systems or base supplies, has certainly been questioned over the years. Since the mid-1990s, the Defense Department has been closely watching some of America's largest companies as they adopt electronic procurement practices to enhance the management of their supply chains. This research effort was launched to examine this rapidly growing area of business called e-procurement, to assess the military's interest and effort thus far with web-based acquisition, and finally to provide recommendations for DoD decision-makers to consider both now and in the future. This assessment first examined the range of electronic procurement venues available today from e-catalogs to market exchanges to end-to-end procurement. In addition, the overall advantages of web-based acquisition were addressed. Next, the possibilities of e-procurement were reviewed through looking at the successful example of IBM. Given its mission, and structure, some may argue that the Defense Department should not even attempt to emulate successful corporations such as IBM and GE. However, embedded in these companies are valuable lessons for the military, such as the way in which IBM intensely analyzed all of its procurement processes before automating them. While the DoD has not initiated an effort comparable to IBM, there is some interest and success

with e-procurement in the U.S. military, especially within the Navy. The Navy is proving successful because it possesses a strategic vision and has worked to integrate the functional "stovepipes" of contracting, finance, and logistics.

As a result of this qualitative assessment, several recommendations were provided for the future of e-procurement in the military. A couple of the recommendations addressed the need for the DoD to continue certain efforts that have been started. For instance, the ETE Procurement Process IPT is on the right track as it seeks to fully understand the procurement process with its "system maps." However, the IPT must pay particular attention to "bottlenecks" and their impact on the efficiency of the entire procurement process. Furthermore, e-procurement must continue to be implemented organization-by-organization instead of mandating an "enterprise-wide" solution. Finally, e-procurement must become a strategic focus at the highest levels of the Department of Defense and the military services. It cannot be simply viewed as a contracting or finance or logistics effort but as a fundamental building block in the effort to "transform." Advocacy by leadership will enable the military to change some of the acquisition culture, particularly with respect to the use of duplicative paper in the procurement process. In addition, leadership must push the use of electronic auctions, reverse auctions, and market exchanges. These forms of e-procurement are providing staggering savings to companies such as IBM, GE, and Boeing and should be used extensively in the military.

Recommendations for Future Study

The research done in this report was qualitative in nature. Quantitative analyses of the costs and benefits of implementing ETE systems within military organizations should

be done. For some smaller organizations, it may prove to be more costly over the long run to implement ETE than to continue with current procurement methods. In addition, detailed quantitative analyses of the costs and benefits experienced by industry with electronic auctions, reverse auctions, and market exchanges would be useful. The savings achieved by these forms of e-procurement appear to be significant, but there may be some hidden costs and difficulties that are not readily observable.

Ultimately, the success of e-procurement in the military will depend on the willingness of senior leaders to see electronic forms of business as vital components in the Revolution in Business Affairs. Commercial industry realizes that procurement and information technology can no longer "stand alone" but must be completely integrated into all processes in their firms. This too must be the approach of the United States military as it embarks on transformation in the twenty-first century.

Appendix A: Proposed Systems Within ETE

The cornerstone of the all of the services' efforts to implement end-to-end procurement is the Standard Procurement System (SPS). Developed in the mid-1990s, SPS used existing commercial systems to automate 13 different procurement functions in one centralized system.[1] Other web-based initiatives that are in various states of completion and undergoing study are as follows:

- The *Electronic Procurement Generator (EPG)* is a tool that will electronically interface with SPS to allow non-SPS users authorized access to limited portions of SPS and will facilitate the translation of procurement requests from external sources into a format that will be interfaced with SPS.
- The *Navy Air Force Interface (NAFI)* provides electronic access to completed contracts and delivery orders to the Defense Finance Accounting Service, the Defense Contract Management Command, and other DoD users. As a result, paper distribution is eliminated.
- The *Purchase Request Builder* automates the process by which a purchase request will be generated between the originator and contracting communities. A purchase request is a document that is generated by an organization that needs a good or service. After technical and funding approval, the purchase

request is converted to a contract and procurement begins. PR Builder will be used to automate the front end of the procurement process, which is the transmittal of the PR data to the contracting office.

- The *Universal Interface* will ensure that data is entered only once but is able to be used multiple times throughout the procurement process without additional human input. This should reduce errors and processing time.
- The *Wide Area WorkFlow – Receipts and Acceptance (WAWF-RA)* is a web-based system for processing invoices, receipts, and acceptance. It allows vendors to create and submit invoices and receive reports electronically via the Internet. WAWF-RA also incorporates electronic notification and on-line processes for government personnel to document receipt and acceptance of goods and services.
- The *Contractor Performance Assessment Reporting System (CPARS)* provides an automated paperless information system for the collection, storage, and retrieval of contractor performance assessment reports that could be used in future source selections.[2]

Notes

[1] Eleanor Spector, "Improving/Standardizing DoD Procurement Business Processes," *Program Manager*, November-December 1997, 10.

[2] Initiative Detail, n.p., on-line, Internet, 20 December 2001, available from http://www.peoarbs.navy.mil,.

Bibliography

ADR 2000. "Defense Reform Initiative." On-line. Internet, 4 December 2001. available from http://www.dtic.mil/execsec/adr2000/chap12.html.

"Air Force Reaps Savings." *Federal Computer Week*, n.p. On-line. Internet, 9 January 2002, Available from http://www.fcw.com.

Alterio, Julie Moran. "Cooking Up Savings." *The Journal News*, 6 December 2001, n.p., On-line. Internet. 20 December 2001. Available from http:/www.thejournalnews.com.

Army E-Business Web Site. On-line. Internet, 26 February 2002, available from http://www.hqda.pentagon.mil/armyc4etech.

Augustine, Norman R. "Reshaping an Industry: Lockheed Martin's Survival Story." *Harvard Business Review*, May-June 1997, 83-94.

Augustine, Norman R. "Leadership." Lecture, Air Command and Staff College, Maxwell AFB, AL, 29 January 2002.

Booz-Allen & Hamilton, *E-sourcing: 21st Century Purchasing*, 2000.

Brower, J. Michael. "The Promise of e-Commerce to Defense: The Road to Savings," *Military Review*, July-August 2001, 97-98.

Byrd, Carol. "The Allure of Reverse Auctions." *Contract Management*, November 2001, 30-31.

Caterinicchia, Dan. "GSA: Auctions Going, Going Strong." *Federal Computer Week*, 2 November 2000, n.p. On-line. Internet, 9 January 2002. Available from http://www.fcw.com.

"Charter for the Department of the Navy eBusiness Operations Office," 21 September 2000, n.p. On-line. Internet, 9 January 2002.

Clinton, President William. Memorandum. To Heads of Executive Departments and Agencies. Subject: Electronic Commerce, 1 July 1997.

Davidson, Dan. "GSA's Newest Buying Tool Slow to Catch On" *Federal Times*, 3 December 2001, 4,23.

Defense Electronic Business Office. On-line. Internet, 4 December 2001, available from http://www.defenselink.mil/acq/ebusiness.

DoN eB Strategic Plan 2001-2002, n.p. On-line. Internet, 7 January 2001. Available from http://www.don-ebusiness.navsup.navy.mil.

"E-Management: Older, Wiser, Webbier." *The Economist*, 30 June 2001, 10.

"E-Procurement in Government." IBM web site. On-line. Internet, 28 January 2002, available from http://houns54.clearlake.ibm.com.

"E-Strategy Brief on GE: While Welch Waited." *The Economist*, July 2001, 24-25.

Gebauer Judith; Carrie Bean; and Arie Segev. "Impact of the Internet on Procurement," *Acquisition Review,* Spring 1998, 167-184.

Gill, James H. "Crisis in the Acquisition Workforce: Some Simple Solutions," *Acquisition Review Quarterly*, Spring-Summer 2001, 85-91.

Gompert, David C. and Irving Lachow. "Transforming U.S. Forces: Lessons from the Wider Revolution." *RAND Issue Paper.* On-line. Internet. Available from http://www.rand.org/publications/IP/IP191/.

Gregory, Bill. "E-Commerce: Paperless Contracting Overcomes Resistance," *Armed Forces Journal International*, November 2000, 14-17.

GSAAdvantage! On-line. Internet, 25 January 2002. Available from http://www.gsaadvantage.gov.

Gurley, J. William. "BigCompany.Com: Should You Start a B2B Exchange?," *Fortune*, 3 April 2000, 260-262.

Hamre, John J. Memorandum to Chairman of the Joint Chiefs of Staff, Under Secretaries of Defense, Defense Directors, and Defense Agency Directors. Subject: Department of Defense Reform Initiative Directive #43: Defense-wide Electronic Commerce, 20 May 1998.

Harding, Elizabeth U.; John P. Desmond; and Colleen Frye. "IBM: Making Money on E-Business," *Software Magazine*, December 1999, 10

Hewitt, Jamie, IBM Vice President of Transformation, Server Group. "White Paper on IBM's Business Transformation," 1998.

Hewitt, Jamie, IBM Vice President of Transformation, Server Group, interviewed by author, 10 December 2001.

Housel, Dr Tom, Professor of Information Technology and Acquisition Management, Naval Postgraduate School, interviewed by author, 26 February 2002.

"In the Air." *Economist*, 1 April 2000, 62.

"Instituting E-Procurement in the Public Sector," *Public Management*, November 2000, 21-25.

Initiative Detail, n.p. On-line. Internet, 20 December 01. Available from http://www.peoarbs.navy.mil,.

"The Impact of B2B." *Computerworld*, 2 October 2000, n.p. On-Line. Internet, 26 November 2001. Available from http://www.computerworld.com.

Kenne, Leslie F. Lt General, "Revolution in Business Practices." Briefing to AFMC/CC, September 2001.

McMichael, Patrick Lt Col, Technical Director, AF Contracting System Program Office, interviewed by author, 26 February 2002.

"Navy and Marine Corps Receive More Than 250 E-Business Proposals," *DefenseLink*, 7 December 2000, n.p. On-line. Internet, 4 December 2001. Available from http://www.defenselink.mil.

"Navy Awards Contract to Build Next Generation of One Touch Support." IBM web site., n.p. On-line. Internet, 28 January 2002. Available from http://houns54.clearlake.ibm.com.

Nemfakos, Charles. "Special Briefing on the Navy's New e-Business Office." *Defense Link*, 7 December 2000, n.p. On-line. Internet, 4 December 2001. Available from http://www.defenselink.mil/news/Dec2000.

Nissen, Dr. Mark E.; Dr. Keith F. Snider; and Dr. David V. Lamm. "Managing Radical Change in Acquisition." *Acquisition Review*, Spring 1998, 89-106.

Nissen, Dr. Mark, Assistant Professor of Information Technology and Acquisition Management, Naval Postgraduate School, interviewed by author, 26 February 2002.

O'Hara, Colleen. "Feds Buy Into Reverse Auctions." *Federal Computer Week*, 14 August 2000, n.p., On-line. Internet, 9 January 2002. Available from http://www.fcw.com.

O'Hara, Colleen. "GSA Moves Ahead with Reverse Auctions." *Federal Computer Week*, 6 June 2001, n.p., On-line. Internet, 9 January 2002. Available from http://www.fcw.com.

Ortiz, Jason Capt, Command eProcurement Functional Manager, HQ AFMC/PK, interviewed by author, 7 January 2001.

Rumsfeld, Donald, secretary of defense. Address. "Kickoff Remarks at the DoD Acquisition and Logistics Excellence Week," 10 September 2001.

Sager, Ira. " Inside IBM: Internet Business Machines." *Business Week*, 13 December 1999, n.p. On-line. Internet, 1 December 2001. Available from http://www.businessweek.com.

Spector, Eleanor. "Improving/Standardizing DoD Procurement Business Processes." *Program Manager*, November-December 1997, 10-12.

Terry, Lisa. "Governments Poised for Widespread E-Procurement Usage." *Washington Technology*, 13 August 2001.

Thurston, Gary and Will Bishop. "End-to-End Procurement Process in DoD." Lecture, Defense Systems Management College, Fort Belvoir, Va., 8 February 2001.

Vaas, Lisa. "GE Keeps E-Business Turned On." *eweek.com*, 12 November 2001, n.p. On-line. Internet. Available from www.eweek.com.

Yandik, Lt Col Paul, Program Manager, Air Force End-to-End Procurement Systems, SAF/AQCK, interviewed by author, 18 December 2001.

Yandik, Lt Col Paul, Program Manager, Air Force End-to-End Procurement Systems, SAF/AQCK. "End-to-End Procurement Model" Briefing, 15 June 2001.